

WHAT IS CLAIMED IS:

1. An isolated nucleic acid selected from the group consisting of:
 - (a) a nucleic acid comprising the coding region of the nucleotide sequence of SEQ ID NO:1, 11, or 13;
 - (b) a nucleic acid encoding a protein comprising the amino acid sequence of SEQ ID NO:2, 12, or 14;
 - (c) a nucleic acid encoding a protein comprising a modified amino acid sequence of SEQ ID NO:2, 12, or 14, wherein the protein encoded by said nucleic acid retains the biological activity of the protein comprising the amino acid sequence of SEQ ID NO:2, 12, or 14;
 - (d) a nucleic acid that hybridizes under stringent conditions to a sequence comprising the nucleotide sequence of SEQ ID NO:1, 11, or 13, and encodes a protein that retains the biological activity of the protein comprising the amino acid sequence of SEQ ID NO:2, 12, or 14; and
 - (e) a nucleic acid encoding a partial peptide of the protein of SEQ ID NO:2, 12, or 14.
2. The nucleic acid of claim 1, wherein the modification referred to in part (c) is a substitution or deletion of less than 20 amino acid residues in the sequence of SEQ ID NO:2, 12, or 14.
3. The nucleic acid of claim 1, wherein the modification referred to in part (c) is a substitution of one or more amino acids in the sequence of SEQ ID NO:2, 12, or 14 with one or more amino acids that allows the properties of a corresponding amino acid side chain to be conserved.
4. The nucleic acid of claim 1, wherein the modification referred to in part (c) is an addition of one or more amino acids to the sequence of SEQ ID NO:2, 12, or 14 that results in a fusion protein.
5. A vector into which the nucleic acid of claim 1 is inserted.
6. A transformant carrying the nucleic acid of claim 1.

1 7. A substantially pure protein or peptide encoded by the nucleic acid of claim 1.

1 8. A method for producing a protein or peptide encoded by the nucleic acid of
2 claim 1, comprising the steps of:

3 (a) culturing a transformant carrying the nucleic acid of claim 1 or a vector into
4 which the nucleic acid of claim 1 is inserted;

5 (b) allowing the transformant to express the protein or peptide; and

6 (c) recovering the expressed protein or peptide from the transformant or culture
7 supernatant.

1 9. An isolated nucleic acid comprising at least 15 nucleotides, wherein the
2 nucleic acid is complementary to a nucleotide sequence comprising the sequence of SEQ ID
3 NO:1, 11, or 13, or to the complementary strand thereof.

1 10. The nucleic acid of claim 9, wherein the nucleic acid is completely
2 complementary to a continuous region of at least 15 nucleotides in the sequence of SEQ ID
3 NO:1, 11, or 13, or has a homology of at least 70% to the sequence of SEQ ID NO:1, 11, or
4 13.

1 11. A method of screening for a compound that binds to the protein or peptide of
2 claim 7, comprising the steps of:

3 (a) contacting a test sample containing at least one compound with said protein or
4 partial peptide;

5 (b) detecting the binding activity of said protein or partial peptide with a
6 compound in the test sample; and

7 (c) selecting a compound that has a binding activity to said protein or partial
8 peptide.

1 12. A compound that binds to the protein or peptide of claim 7.

1 13. The compound of claim 12, wherein said compound is an antibody.
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1 14. The compound of claim 12, wherein said compound is isolated by a method
2 comprising the steps of:

3 (a) contacting a test sample containing at least one compound with said protein or
4 partial peptide;

5 (b) detecting the binding activity of said protein or partial peptide with a
6 compound in the test sample; and

7 (c) selecting a compound that has a binding activity to said protein or partial
8 peptide.

1 15. A transformant carrying the vector of claim 5.